ANALYZING THE POTENTIAL FOR INTERSTATE COLLABORATION TO CATALYZE THE OFFSHORE WIND INDUSTRY IN THE U.S. SOUTHEAST

by
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Executive Summary

The U.S. Southeastern states of Virginia, North Carolina, and South Carolina possess the resource potential, port infrastructure, and interest from developers necessary to become a hotbed for offshore wind development activity moving forward. Despite this potential however, many key challenge areas exist that would either hinder or prevent the full development of a sustainable industry in the region. This Capstone project has utilized interviews of industry experts to both identify these key challenge areas as well as discuss the efficacy of interstate collaborative models as a solution to overcoming these challenges. Reviews of existing literature were also used to ground-truth information provided by sources.

This project has found that while the three states host vastly different offshore wind development landscapes, prevailing key challenges exist in communication and outreach around offshore wind developments in the region, managing conflicting uses, and identification of collective needs and assets in the regional supply chain. Research has also found that an informal, regulatory model of interstate collaboration similar to the former Governors' South Atlantic Alliance is better suited to address these challenges over a more formal public authority model such as a power authority.

Keywords: offshore wind, southeast, interstate collaboration

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Introduction

Over the past several years, the United States has entered the global offshore wind conversation as the potential for a sizeable industry has become more evident. Blessed with bountiful resource potential off both the Atlantic and Pacific coasts located near significant load centers, the physical geographical aspects more than make the case for a booming American industry. In its landmark 2015 report titled *Wind Vision: A New Era for Wind Power in the United States*, the U.S. Department of Energy (DOE) set the following targets for wind electricity as shares of the overall U.S. electricity mix: 10% by the year 2020, 20% by 2032, and 35% by 2050 (U.S. Department of Energy, 2015). This *Wind Vision* scenario calls for 86 gigawatts (GW) of offshore wind to be developed by the year 2050, accounting for 11% of the nation's total electricity mix.

Despite these ambitious goals, development activity has largely been confined to the Northeast and Mid-Atlantic corridors. As shown by Figure 1, of the 12,544 total MW of offshore wind power either awarded or scheduled as of April 2020, 12,532 MW come from these two regions, with the 12-MW Coastal Virginia Offshore Wind project serving as the exception (Cohen & Shreve, 2020). This nascence isn't for lack of a resource however as Virginia and the Carolinas have significant technical offshore wind potential (Beiter, et al., 2016). The Southeast is also home to large deep-water ports in Hampton Roads, Wilmington, and Charleston needed to stage and marshal utility-scale offshore wind farm development infrastructure. It is no secret however that the state of Virginia, North Carolina, and South Carolina each harbor quite a few challenges to the offshore wind development industry.

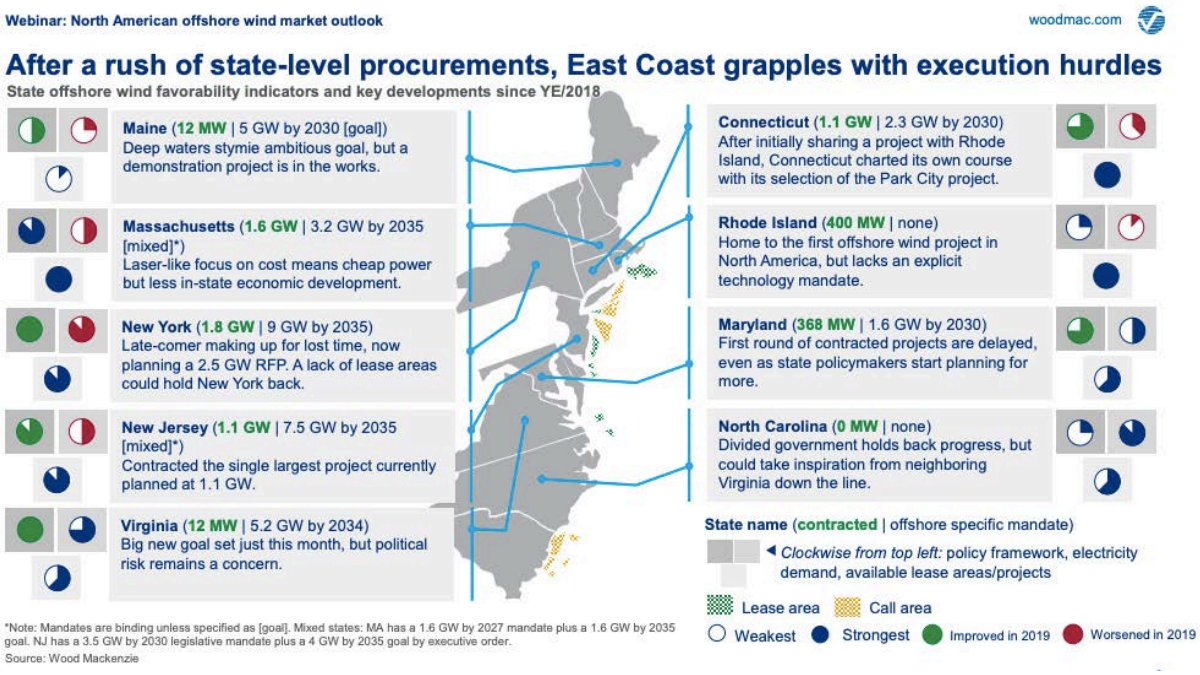

Figure 1: Current offshore wind development landscape on the U.S. East Coast as provided during April 28, 2020 webinar *North American Offshore Wind Market Outlook* (Wood MacKenzie, April 2020).

This study aims to address those key challenge areas identified in the *Wind Vision scenario*, but with a particular focus on the Southeastern states of Virginia, North Carolina, and South Carolina. While the ever-increasing pipeline of OSW projects in massively tilted to states in the Northeast, the southeastern market has a unique opportunity to identify best practices from early movers. The ultimate research question addressed by this study is ***in what ways could the Southeastern states of Virginia, North Carolina, and South Carolina partner to overcome key challenge areas and facilitate the development of a sustainable offshore wind industry in the region?*** Interviews have been conducted with offshore wind experts (OSWE) with professional experience in policy and development in the three states to determine what key challenge areas are hindering the development of a sustainable offshore wind industry in the region. OSWEs have also been asked about the potential for interstate collaboration as a way to solve these issues with an accompanying review of gray literature on three interstate cooperative models. Finally,

the study will aim to determine which interstate cooperative model is best suited overall to address these key challenges for the benefit of all state participants and will recommend the best interstate course of action that should be taken to bolster the prospects of sustainable offshore wind industry in the U.S. southeast.

Methods

Interviews of Offshore Wind Experts

The approach to data collection for this research project was a mixed methodology consisting of semi-structured interviews and literature review analysis. To begin, in order to extract key challenge areas to a sustainable offshore wind industry in the Southeast, over-the-phone interviews were conducted with five offshore wind experts (OSWE) with experience in offshore wind development policy in the region. Each of these OSWEs were chosen because of their depth of knowledge of an experience in offshore wind development in the Southeast. Despite the industry's momentum in the Northeast, very few practitioners exist that have either exposure or experience with the Southeastern market, and each of the OSWEs has both. Seven practitioners were sent interview requests in total, with five positive responses received in-time for proper interview execution and data coding.

OFFSHORE WIND EXPERTS	ORGANIZATION	LOCATION	POSITION
Salvo Vitale	US Wind	Baltimore, MD	Head of Country
Katherine Kollins	Southeastern Wind Coalition	Raleigh, NC	President
Liz Burdock	Business Network of for Offshore Wind	Baltimore, MD	CEO & President
Nancy Sopko	Special Initiative for Offshore Wind	Newark, DE	Executive Director
Hayes Framme	Ørsted	Richmond, VA	Manager, Government Affairs & Communications

Figure 2: Offshore Wind Experts (OWSEs) interviewed for this Capstone project during late March and early April of 2020.

The two offshore wind development representatives interviewed were Salvo Vitale, Head of Country for U.S. Wind, and Government and Communications Manager for Ørsted Hayes Framme. U.S. Wind showed very real interest in developing the Grand Strand Call Area – a sizeable area designated for development in a previous call for nominations running between North Myrtle Beach and Georgetown, South Carolina – through its February 2016 response to BOEM's Call for Information and Nominations Docket No. BOEM-2015-0314, before eventually rescinding its nomination (Bureau of Ocean Energy Management, 2016a). Ørsted is the world's largest offshore wind developer with 11-GW of total offshore wind assets accounting for a 12.86-percent global market share (International Energy Agency, 2019). Among other leases held in New York, New Jersey, Rhode Island, Massachusetts, and Maryland, Ørsted is also developing the two-turbine 12-MW Coastal Virginia Offshore Wind Project (CVOW), the first project in the U.S. to be developed in Federal Waters (Bureau of Ocean Energy Management, 2019).

The three trade-industry leaders interviewed were Katherine Kollins, President of the Southeastern Wind Coalition, Liz Burdock, CEO & President of the Business Network for Offshore Wind (BNOW), and Nancy Sopko, Executive Director of the Special Initiative for Offshore Wind (SIOW) at the University of Delaware. Katherine has been intimately involved with both onshore and offshore policy and developments efforts in the region since joining the coalition is 2015. BNOW has become one of the leading advocate organizations for business practices and policies that spur growth in the U.S, offshore wind industry through a series of policy water papers, advocacy and media initiatives, and the annual International Partnering Forum which brings together offshore wind businesses throughout the supply chain annually in a different, emerging U.S. city. The SIOW has long been a source of policy and financial expertise

for the industry, most recently demonstrated by the 2019 publication of its *Supply Chain Contracting Forecast for U.S. Offshore Wind Power*, which forecasts a $68 billion supply chain opportunity for business involved with the U.S. offshore wind industry over the next decade (McClellan, 2019).

Each Interview was conducted over-the-phone between March 29 and April 1, 2020, and each call was recorded using the Rev Recorder application on the researcher's iPhone XR, with the exception of the first interview. Due to user error on the part of the researcher for the first interview, the Rev Recorder application was abandoned and the call was recorded on the researcher's work phone using the Apple Voice Memo application. An overall summary of the research was given to each interviewee, and consent to use each interviewees name, company, and job title was requested verbally. The author served as student investigator for the requisite Homewood Internal Review Board (HIRB) process, and ultimately received approval HIRB00010942 under review type Not Human Subjects Research. Each interviewee described personal dealings due to the outbreak of COVID-19, and one interviewee had to reschedule our original interview time due to be displaced from work by a Gubernatorial Executive Order. In an attempt to properly frame and organize interviews in a semi-organized structure, the questions pre-written questions provided in Appendix A were planned for each interview.

The questions were crafted using as guidance the *National Offshore Wind Strategy* co-authored by DOE and the Department of the Interior (DOI) in September of 2016, which presented a national framework for achieving the development goals outlined in the *Wind Vision Scenario*. The *Strategy* identified three overarching key challenge areas to a sustainable U.S. offshore wind industry: 1) reducing the costs and technical risks associated with domestic offshore wind development, 2) supporting stewardship of U.S. waters by providing regulatory

certainty and understanding and mitigating environmental risks of offshore wind development, and 3) increasing understanding of the benefits and costs of offshore wind energy (U.S. Department of Energy & U.S. Department of the Interior, 2016). To address challenge area #1, DOE and the New York State Energy Research Development Authority (NYSERDA) partnered to establish the National Offshore Wind Research and Development Consortium (Consortium) in 2019. As described in the *Research and Development Roadmap 2.0*, the Consortium is focused on addressing this first key challenge area by searching for innovative methods to lowering the levelized cost of energy (LCOE) via the main sub-pillars addressed in the *National Offshore Wind Strategy*: 1) Offshore Wind Plant Technology Advancement 2) Offshore Wind Power Resource and Physical Site Characterization 3) Installation, Operations and Maintenance, and Supply Chain (National Offshore Wind Research & Development Consortium, 2019). In an effort to bring some formal structure to the interview, the author used Pillars 2 and 3 of the *National Offshore Wind Strategy* to frame the questions. In the Discussion Section, any literature relevant to a particular challenge area and/or answer provided by an OSWE expert has been incorporated to either bolster or refute a claim made by an OSWE. Where necessary, written description of interview results have been accompanied by literature, charts, pictures, or graphs to more clearly communicate and answer given or observation made by an OSWE.

Literature Reviews of Cooperative Models

This study also involved case studies of three regional cooperative models in the U.S that have managed or are currently managing a public resource – the Atlantics States Marine Fisheries Commission (ASMFC), the Port Authority of New York and New Jersey, and the Governor's South Atlantic Alliance. These three models were chosen due to their relevance to the management of interstate offshore wind issues. The ASMFC manages marine fisheries across

the Atlantic seaboard, the Port Authority of New Jersey and New York manages infrastructure and transportation asset in the New York Harbor area, and the Governor's South Atlantic Alliance was devoted to the interstate stewardship of coastal marine ecosystems. The coastal, environmental, and energy related nature of these models relating to the management of common-pool natural resources make them suitable starting places for a discussion on potential interstate offshore partnership models between Virginia, North Carolina, and South Carolina.

Limitations

The author found scoping of this research project to be a very difficult challenge to overcome. The massive growth of the U.S. offshore wind industry has created a flurry of state-level commitments, solicitation awards, preferred partnership announcements, and many other significant industry developments over the past two years with long-term implications for the industry. This created a fear of focusing on a less important aspect of the industry, or engaging in research the would become upended in a matter of months as the industry continues to evolve. Furthermore, focusing on Virginia, North Carolina, and South Carolina as a single entity created issues since many answers were provided differently for each state. The policy environment for offshore wind development in the Commonwealth of Virginia is far different than that of South Carolina, which gave interviewees pause when answering questions in a regional context.

A slight hinderance came in the form of the HIRB process that was undertaken later in the process than desired. The researcher vastly underestimated the just how involved of a process it was despite multiple warnings from lead research faculty. While the time informally predicted for the approval of the HIRB case for this research project was 48 hours by Johns Hopkins EPC faculty, the approval process actually took two weeks, which greatly shortened the window in which the interviews data collection process could take place. The onset of the COVID-19

epidemic also played a minor limiting role in the data collection process, as interviewees were displaced from their normal workflows, and schedules had to rearranged. In one case however, this disruption allowed for one interview to be available for a greater swath of time during the week than they would have otherwise been available pre-COVID-19.

Finally, coding of data obtained through the interviews proved to be a challenge. throughout all of the interviews, the semi-formal structure quickly began to unravel, and the conversation instead evolved into more of an open discussion about what each OSWE sees as the key challenges to a sustainable offshore wind industry in the Southeast, if an interstate partnership makes sense in this context, and what form that partnership might take. In an attempt to retain some form of quantitative structure, each OSWE was asked to rank-order their top five challenge areas to a sustainable offshore wind industry in Virginia, North Carolina, and South Carolina. Despite requests for clarifications, some answers provided by OSWEs had to be placed into one of five key challenge areas at the discretion of the researcher. For the First Key Challenge Area – Lack of Economic Case and/or State Level Policy Support might seem like a broad swath until one considers that all potential state level measures that could be passed in order to support offshore wind (ie. RPS and OREC regimes) would benefit the industry in a purely economic manner. An RPS mandates that load-serving entities (LSEs) source a portion of the power the transmit to rate-payers from offshore wind and an OREC regime lowers to cost of that offshore wind power and adds profit for the developer.

Findings

Interviews with OSWEs and Corresponding Literature Review on Key Challenge Areas

To begin, OSWEs were asked to list their top challenge areas to a sustainable offshore wind industry in the Southeast. Figure 3 list the answers to this question for each interview, and the corresponding findings section further codes and synthesizes data provided.

OSWE	Challenge Area 1	Challenge Area 2	Challenge Area 3	Challenge Area 4	Challenge Area 5
US Wind	Lacking State policy support	Conflicting Uses	Tropical Cyclones	**X**	**X**
Southeast Wind Coalition	Lack of off-takers/low existing elect prices	Transmission	Regulatory/Legislative Pathway	Sightline Impacts	Right Whale Impacts
Business Network for Offshore Wind	Lacking State level policy support	Tourism	Sightline Impacts	Regulatory/Legislative Pathway	**X**
Special Initiative on Offshore Wind	Low cost of energy in SE	Military Conflicts	Latent mover status of southeast states	NIMBYism	POLITICS?
Ørsted	Regulated structure of utilities	Differing policy and priority tracks	Lack of (ocean) Real Estate approved for development	Lack of competitive developers in region	**X**

Figure 3: Coding Matrix of OSWE's answers to questions of key challenge areas to the development of a sustainable offshore wind industry in the U.S. Southeast

Prevailing Key Challenge Areas:

<u>Lack of an Economic Case</u>

Katherine Kollins of the SEWC listed the lack of an economic case as her top key challenge area, and in reference to South Carolina offered that she didn't see "a viable pathway to market for developers in South Carolina" citing the existing low cost of electricity for rate-payers in the Palmetto State (K. Kollins, personal communication, March 31, 2020). Kollins sees the massive difference between the current price of electricity in South Carolina vs. the price tag to deliver the same amount of offshore wind from a wind farm off the South Carolina coast to be a non-starter for most potential electricity buyers. This very slim pool of off-takers makes the case the for a Palmetto State offshore wind farm a very tough sell economically for most developers and investors alike. She also contended that the lack of high-density load-centers in

both coastal North Carolina and South Carolina contributes greatly to this issue. Unlike early adopting states like Massachusetts and New York, the Carolinas have a comparatively massive dearth of population centers located near the coast. Figure 4 shows the contrasting opportunities for off-takers in the Northeast region to those of the Southeast by comparing the populations of the largest load centers in Massachusetts, New York, Maryland, Virginia, North Carolina and South Carolina as well as their respective distances to the Ocean. While both the Boston and New York City Metro Statistical Areas (MSAs) are located on the coast and are home to approximately 20 million and 5 million residents respectively, North Carolina and South Carolina's largest load centers – Charlotte-Concord-Gastonia-Rock Hill and Greenville-Spartanburg-Anderson MSAs – are home to approximately 2.5 million and 1.4 million residents respectively (U.S. Census, 2018), (Google Maps, 2020). This situation has already caused an issue with the only offshore wind farm planned for the Carolinas, as the power generated from the Kitty Hawk Wind farm will be wheeled out of the Carolina service territory and into Virginia Beach (Metcalf, Feb. 2020). The exorbitant capital costs for the additional substations and high-voltage direct current (HVDC) transmission lines needed for power delivery to many of these southerly load centers make the prospect a grim one for developers and policy makers in the Carolinas looking to diverse the clean energy mix.

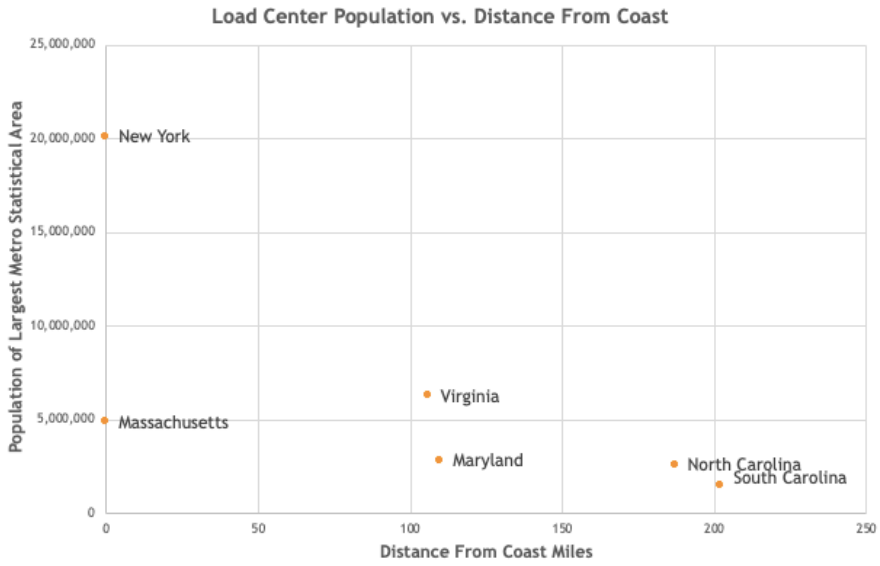

Figure 4: The largest population for the largest Metro Statistical Area (MSA) for each state was found using the U.S. Census Bureau Census reporter website (U.S. Census Bureau, 2018) and Distance from Coast in miles was calculated using the GoogleMaps Measure Distance Tool. Distance to the coast was taken from the largest city in the respective MSA.

This concern over price was also communicated by SIOW Executive Director Nancy Sopko when she expressed the top key challenge area as "the cost delta between what residents in the Southeast are currently paying, and what they will pay for offshore wind" (N. Sopko, personal communication, April 1, 2020). The difference between the cost of electricity for customers in the Northeast after offshore projects have been interconnected compared with the existing cost, isn't nearly as a big of a problem as in the Southeast where capacity factors for offshore wind projects are lower as are existing electricity prices. As Sopko mentioned, the 30-MW Block Island Wind Farm actually lowered the cost of electricity for rate-payers in Rhode Island since residents on Block Island were previously paying a high premium for diesel-sourced electricity which was priced as high as 60 cents/kWh in 2008 (Froese, 2017). Sopko also mentioned that this high cost of offshore wind relative to the existing price of electricity was a source of early concern and hesitation on the part of Dominion, the utility has since moved forward with developing the CVOW off Virginia Beach. Despite all of the barriers to market

entry, Sopko notes that “the cost of offshore wind is going down in staggering, shocking way”, which is likely driving interest like to Dominion to continue to pursue build-out of their lease sites (N. Sopko, personal communication, April 1, 2020).

Figure 5 compares the average price of electricity and the total retail sales figures of New York and Massachusetts in the Northeast, Maryland in the Mid-Atlantic, and Virginia, North Carolina, and South Carolina in the Southeast. While the price of electricity for the three Southeastern state hovers at around nine cents per kWh, electricity in Massachusetts is currently double the price at 18.5 cents per kWh, with the New York price-tag coming in a just under 15 cents per kWh(Energy Information Administration, 2019). Regarding total retail sales, New York and North Carolina lead the pack at 150 terawatt hours (tWh) and 138 tWh respectively, with Massachusetts and Maryland trailing the pack at 53 tWh and 62 tWh respectively.

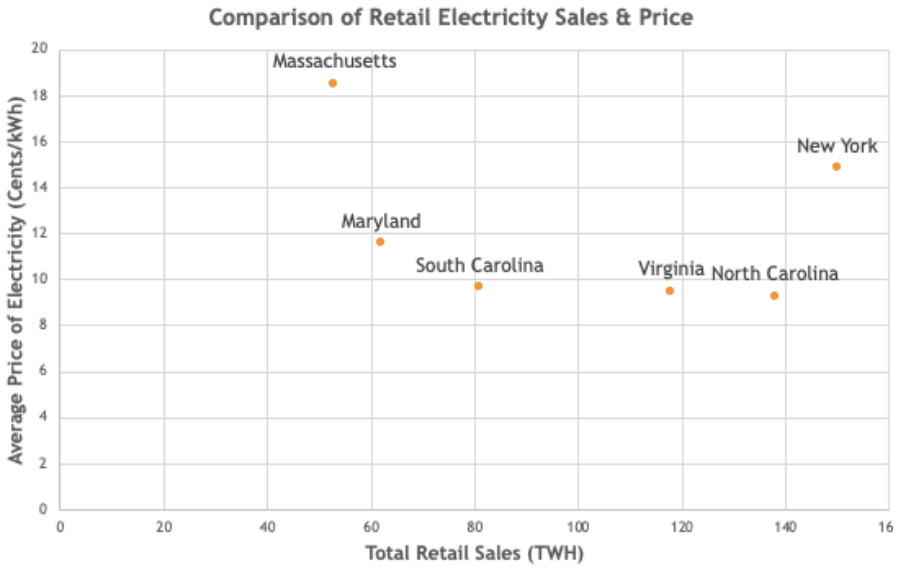

Figure 5: Comparison of the energy markets of states located in the Northeast vs states located in the Southeast. (U.S. Energy Information Administration, 2020). Electricity data from 2018.

The business case for offshore wind development in the Southeast becomes even more challenging when the existing lower cost of electricity is couple with the higher-priced projects compared to those in the Northeast. Figure 6 shows a comparison between the flurry of offtake

agreements recently reached in the Northeast, with that of the lone agreement in the Southeast - the CVOW project off Virginia Beach. A race of sorts to develop the lowest price of electricity in in full-force in Massachusetts where the original lowest price for an offshore wind project in the country of $65 per MWh for the Vineyard 2 project (U.S. Department of Energy, 2019) was beat in February of 2020 by Mayflower Wind at the new champion price tag of $58 per MWh (Richard, 2020). This is again in stark comparison to that of the CVOW project at $788 per MWH, the high price for which is due largely to the two-turbine, 12-MW small scale of the project (U.S. Department of Energy, 2019).

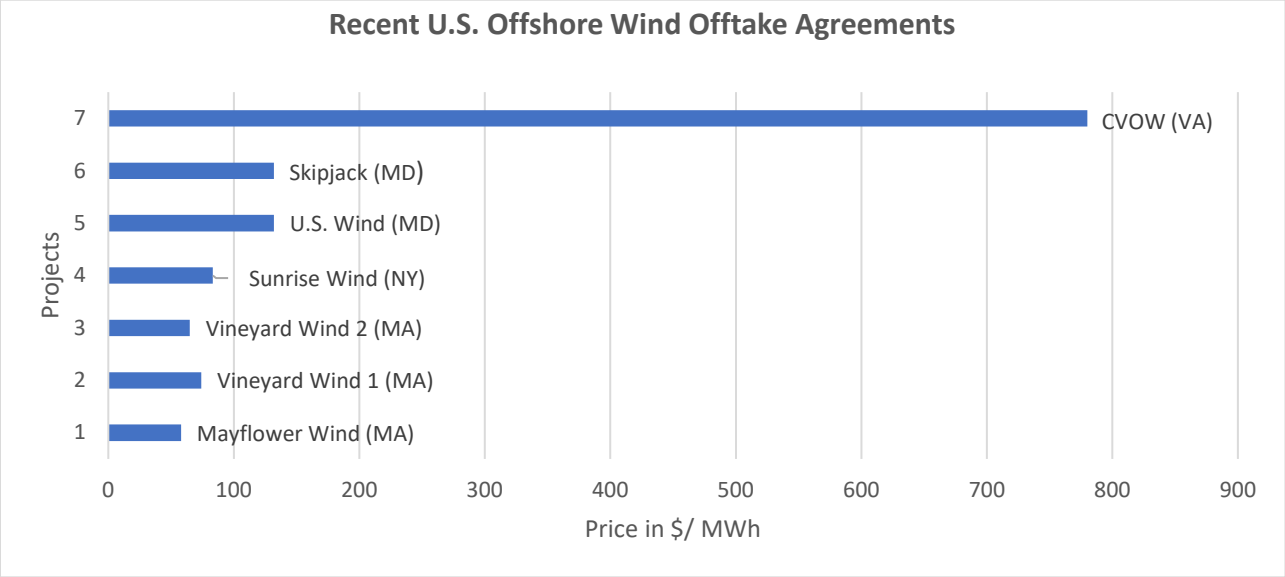

Figure 6: Recently awarded Offtake agreements for projects in MA, NY, MD, and VA. SOURCE: Projects 2,3,5,6,7 (U.S. Department of Energy, 2019) Project 1(Richard, 2020) Project 4 (

State Level Policy and Regulatory Pathways

While Virginia, North Carolina, and South Carolina have had a long history of being laggards in advancing policies supporting the development of clean energy, the Commonwealth of Virginia has very recently reversed course with the passage of the Virginia Clean Economy Act of 2020, which among of their standards, mandated the development of 5.2 GW of offshore

wind in the Commonwealth by the year 2034 (Office of Virginia Governor Ralph S. Northam, 2020). Due to these legislation and various serious steps by Governor Ralph Northam to turn the Hampton Roads region into an epicenter of offshore wind, every OSWE agrees that Virginia is fully committed to the industry and is therefore removed from the discussion about lacking political or policy support for offshore wind development in the Southeast.

Salvo Vitale with U.S. Wind stated "the Southeast is not the optimal place for a wind farm and the very first thing lacking in the southeast is the political will to incentivize renewable forms of energy"(S. Vitale, personal communication, March 29, 2020). Vitale contends that while U.S. Wind had initially intended to develop the Grand Strand call area with its shallow, sloping shelf conducive to offshore wind development, the lack of a renewable portfolio standard (RPS) and corresponding offshore renewable energy credit (OREC) regime made the economics unfeasible for the firm until technology costs decline further. While U.S. Wind did offer other challenges that will be addressed later in this paper, many of the technical issues prevalent with other offshore wind farms such as siting and transmission weren't even addressed since the lack of an economic cases caused the firm to eventually recall their nomination.

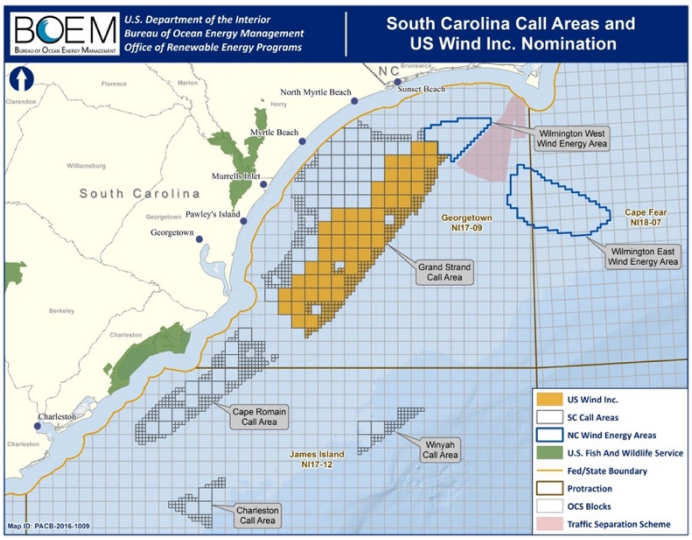

Figure 7: U.S. Wind's Grand Strand Call Area shown in orange (Bureau of Ocean Energy Management, 2016a)

The SIOW expects that legislation supporting offshore wind development will come out of the North Carolina State House "sometime in the next decade", though current prospects look grim considering the Republican control over both the House of Representatives and Senate (N. Sopko, personal communication, April 1, 2020). Driven by Duke Energy's recent commitment to carbon neutrality, North Carolina has begun to move the needle on offshore wind. "Duke doesn't have a regulatory pathway for offshore wind, therefore the State of Carolina really has to mandate to development of the technology"(K. Kollins, personal communication, March 31, 2020). As far as Palmetto State policy is concerned the Southeastern Wind Coalition mentioned the deep-seated reluctance of the State's Executives and Legislators to take any action. And the current Governor's hesitance to even appoint someone to the task force for BOEM Carolina Long Bay Task Force - "I don't know how you get around that, really"(K. Kollins, personal communication, March 31, 2020).

The vertically-integrated structure of utilities operating in the region also makes for a different and sometime challenging environment for developers. Hayes Framme with Ørsted contends that the regulated, investor-owned structure of the utilities involved could limit the competition in Virginia, North Carolina, and South Carolina. The dominance over the market by Dominion and Duke Energy makes it extremely "tough for independent developers to inject themselves into the market" (H. Framme, personal communication, April 2, 2020). This point is bolstered by the commitment from Dominion Energy to development the entire 2,400-MW unnamed project without an independent developer or engineering, procurement, & construction (EPC) firm, instead "drawing from lessons" learned from construction of the 12-MW CVOW farm which will be built by Framme's Ørsted (Stromsta, 2019).

Framme and other OSWEs also mention just how different, and in many cases divergent, the regulatory and policy pathways are for each State. As late adopters to offshore wind, none of the three states has the regulatory apparatus already in place to facilitate such a massive shift to offshore wind development (N. Sopko, personal communication, April 1, 2020). Early apprehension to offshore wind projects be regulators came through the 2018 Virginia State Corporation Commission approval of the CVOW when "liberally construe" the law to find such offshore wind projects to be "in the public interest" (Dietrich, 2018).

State	**RPS**	**OSW Target**	**Project Pipeline**	**Upcoming Solicitations**
Virginia	100% carbon-free electricity by 2045	5.2 GW by 2034	CVOW – 12-MW under construction Unnamed project – 2,600-MW announced by Dominion Energy	None
North Carolina	Investor-owned utilities: 12.5% by 2021; Electric co-op, municipal utilities: 10% by 2018	None	Kitty Hawk Wind – 2,500 MW capability, actual size not yet disclosed	None
South Carolina	2% of aggregate generation capacity by 2021, voluntary	None	0 MW	None

Figure 8: Comparison of policies relating to offshore wind in VA, NC, and SC, as well as corresponding project development pipeline. SOURCES: RPS & OSW Target – (Database of State Incentives for Renewable Energy (DSIRE), 2020) Project Pipeline VA (Dominion Energy, 2019) NC (Kittyhawkoffshore.com, 2020) SC and Upcoming Solicitations (BOEM, 2020)

As evidenced by lessons learned in Virginia, much is left to be desired with the existing regulatory process at the State level in the Old Dominion. One of the lessons learned that was revealed during a 2016 meeting of the BOEM Virginia Offshore Wind Task Force was the lack of maturity in the regulatory process, particularly around approval timelines on behalf of regulatory agencies. (Bureau of Ocean Energy Management, 2016b.). Without steadfast accountability on behalf of regulators around such timelines, developers will continue to suffer from an inability to predict when projects could potentially move forward, therefore raising the likelihood of unnecessary delays.(Bureau of Ocean Energy Management, 2016b.)

Conflicting Uses Issues and NIMBYISM

With a heavy military presence, vast National Seashore acreage abutting the Atlantic Ocean, and a cadre of coastal towns in direct opposition to offshore wind development, the Southeast region certainly has its share of conflicting use challenges. Among the rankings of U.S. states with the most military personnel, Virginia ranks second with 130,547, North Carolina ranks fourth with 102,671, and South Carolina comes in a ninth with 36,349 total service members (Department of Defense, 2019). With over a quarter of a million active-duty service members based in these three states – and not to mention the similarly high-ranked southerly neighbors – Florida and Georgia – the Southeast is far-and-away the most densely militarized region of the U.S. While military conflicts certainly do come into plan when planning offshore wind areas and leases in the northeast and New York bight in particular, the dense and active concentrations of military bases close make planning for development in the Carolinas particularly challenging (N. Sopko, personal communication, April 1, 2020).

The colloquialism not in my back yard (NIMBY) first hit the American lexicon during opposition against attempts by utilities to build nuclear power-power plants in Massachusetts and Michigan (Kinder, 2014) and has remained a forefront obstacle to the growth of the U.S. offshore wind industry as a whole. One of the top prevailing challenge areas expressed by OSMEs was sightline issues, particularly for beach communities in the Carolinas. While communities such as Myrtle Beach South Carolina have expressed excitement and support for the prospect of having offshore wind projects (N. Sopko, personal communication, April 1, 2020). Citing an entirely different culture long-opposed to renewable energy projects, Sopko and Burdock see the tourism industry and the need for a beach-view free of turbines to be a very

really potential issue for development in the region (N. Sopko, personal communication, April 1, 2020), (L. Burdock, personal communication, April 1, 2020).

Environmental Issues

Of particular note when discussing environmental issues was the lack of mention of the commercial fishing industry, which has been a forceful opponent to many projects in the Northeast. As Sopko described, the issue is not yet "the clarion call from commercial fisherman, at least not until construction" (N. Sopko, personal communication, April 1, 2020). Sopko did however raise the issue of interference with the Atlantic Right Whales as a far bigger issue that is not been given nearing the attention that it needs in the region. This happens to be a bridge issue between the Northeast and Southeast lease areas and WEAs as the National Oceanic and Atmospheric Administration (NOAA) has designated two critical habitat areas along its entire range: The New England Coast (foraging area) and the South Atlantic Coast from Cape Fear to Cape Canaveral (calving area) (National Oceanic and Atmospheric Administration, n.d.). Concern over the issues in the Massachusetts lease areas caused Vineyard Wind to take a proactive approach an enter into an agreement to mitigate the harm caused by the firm's 84-turbine project in early 2019 with several the Natural Resources Defense Council and the Conservation Law Foundation (Conservation Law Foundation, Jan. 2019).

The other issue relevant to the environment raised by OSWEs came in the form U.S. Wind's concern for the potential for tropical cyclones to do very real damage to a company's offshore wind assets (S. Vitale, personal Communication March 29, 2020). When pressed on the concern Vitale clarified that hurricanes offshore the Carolinas where the water is very water and conducive to such weather events throughout the year, could wreak havoc on offshore wind turbines unless OEMs begin to design a solution. Vitale did mention that while the industry is

dominated by only a few OEMS at the moment, a large Chinese firm "MingYang is also one of these giants and they did a great work with "tropical storm-grade certified turbines" (S. Vitale, personal Communication March 29, 2020). Vitale continued that MingYang has a U.S. business development representative who is looking at using the tropical storm worthiness of his turbines as potential pathway for market entry.

Interview with OSWEs on Cooperatives Models

In addition to asking about key challenge areas, each OSWE was pressed on their thoughts about interstate collaboration, their experiences, and if they thought any particular model worked the best. With limited exception most OSWE interviewed voiced their openness to the idea of interstate collaboration in the Southeast: "Our worst nightmare – the fragmentation of the number of authorities we have to deal with. One single entity would help streamline " The Direction (of trying to form an interstate collaborative) is certainly the right one" (S. Vitale, personal communication, March 29, 2020). "The more collaboration the better" (K. Kollins, personal communication, March 31, 2020). Skepticism around the idea did pervade the interviews however as OSWEs were doubtful that such a system would be best suited for to address the key challenge areas. Having participated in interstate partnerships in the past, the BNOW expressed doubtful that a formal partnership of any kind could be help in a constructive manner to the industry. "Just look at COVID-19, regional cooperation is not happening and it's not going to work. Getting it formalized is going to be extremely tough" (L. Burdock, April 1, 2020).

Hayes Framme with Ørsted also questioned why states would be motivated to become involved with such a collaboration with all three states "moving at different speeds and following different regulatory pathways" (H. Framme, personal communication, April 2, 2020). Framme

admits that while he did initially believe that interstate partnership would be a great approach, further analysis of the market and policy landscape revealed that the benefits aren't clear to state leaders of such an arrangement. While Framme contends that "regular dialogue and regular interactions" between the states is certainly a best practice, the real questions should be whether such a cooperation helps to create regulatory consistency, develops critical mass, and ultimately lowers the cost of offshore wind in the Southeast. Finally, Framme offers that the vertically integrated utilities involved in these state – Dominion and Duke Energy – are perhaps better suited to form some sort of compact that allows for the region to serve as a single market. (H. Framme, personal communication, April 2, 2020).

Why Interstate Collaboration?

As offshore wind commitments and projects continue to amass in the Northeast and Mid-Atlantic, it has become evident to industry leaders and policy makers alike that many environmental, political, and economic aspects of the industry don't abide by state boundaries. In 2017, The Clean Energy States Alliance (CESA) completed its two-year long collaboration in which it brought together the states of New York, Massachusetts, and Rhode Island with the goal of to identify opportunities for cooperative action by states in the Northeast to "help deploy offshore wind at the scale necessary to reduce costs and establish a regional supply chain" (Clean Energy States Alliance, 2018). The collaboration involved three studies to measure the collective wind resource in the region, the job creation potential, and strategies for navigating compliance with the Jones Act for offshore wind turbine installation vessels. A high market scenario found that 8,000 MWs by 2030 could yield over 16,000 full-time equivalent (FTE) baseline jobs – those likely to be performed in the U.S. – by the year 2028, and a low market scenario that halved both figures. Vessels design techniques were also realized that could potentially lower the

cost of those vehicles able to legally operate in the region during installation activities (Clean Energy States Alliance, 2018, p. 4). A 2019 McKinsey & Company report on the potential for East Coast interstate collaboration revealed that while states are better off going it alone regarding workforce development and providing long-term stability, a strong case for collaboration exists in three areas: stakeholder management and buy-in, investments in electric-grid extensions and upgrades, and research and development (R&D) (Lefevre-Marton, Sellschop, Tai, & Tsui, 2019).

Perhaps the most important attribute of the case for interstate collaboration around offshore wind, is the recent insistence of the Federal Governments' on the industry developing regional planning approaches moving forward. In the June 2019 message titled "The Path Forward for Offshore Wind Leasing on the Outer Continental Shelf" BOEM Acting Director Walter Cruickshank made a regional approach to the industry the overarching message (Bureau of Ocean Energy Management, 2019b.) Cruickshank's message served as a formal response to input provided to the agency through the 2018 Request for Feedback (RFF) on the Proposed Proposed Path Forward for Future Offshore Renewable Energy Leasing on the Atlantic Outer Continental Shelf. As per the message, "successfully harnessing this natural, renewable resource(offshore wind) will require:

- Reducing potential conflicts with other uses of the ocean and seabed.
- Identifying, avoiding or mitigating environmental impacts.
- Developing a reliable supply chain for the industry" (Bureau of Ocean Energy Management, 2019b.)

In order to reach these goals, BOEM announced this it was will forward with a regional leasing and planning process for both projects currently in its pipeline, as well as those yet to be

announced using the planning factors included in Figure 9. Included in the seven regional clusters are two relevant to the Southeast – VANC and Carolina Long Bay. VANC couples the planning and leasing processes of both Virginia and North Carolina and seeks to work use existing intergovernmental task forces in the two states to identify future lease opportunities. Carolina Long Bay is a combination of the planning and leasing processes for the wind energy areas (WEAs) offshore Wilmington, NC and the Call Areas offshore South Carolina, with the aim of forming a regional body similar to the partnerships existing in the Northeast (Bureau of Ocean Energy Management, 2019b.). Two lease sites currently held by Ørsted – South Fork Wind and the Revolution Wind – straddle both Massachusetts and Rhode Island as part of a joint planning effort encouraged by BOEM starting in 2011 (Bureau of Ocean Energy Management, 2020). Despite predicting that additional lease areas would be release for Carolina Long Bay last year, no additional public announcements have been made to-date.

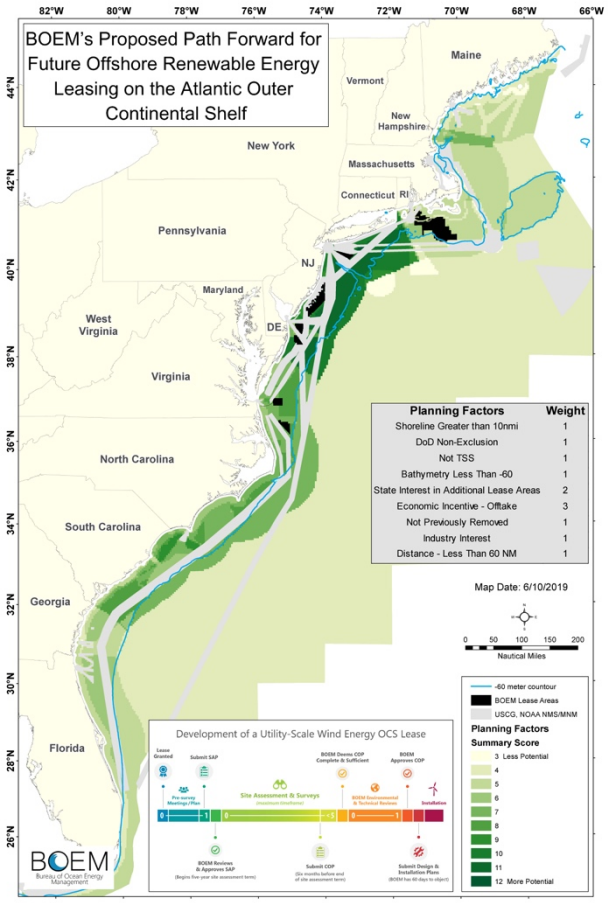

Figure 9: BOEM Proposed Path Forward Map of Planning Factors (Bureau of Ocean Energy Management, 2019b).

Although the findings presented to this point have identified numerous challenge areas to the development of a sustainable offshore wind industry in the Southeast, relying on the regional ambitions of BOEM doesn't address the "how" of the research question. The next section of the paper will examine three of the many potential cooperative models that could be used to forge an interstate offshore wind compact between VA, NC, and SC. These models have been used for interstate administration of public natural resources that span state borders in the U.S., and each has employed both best practices and poor management practices, and each model represents a distinct structural approach possibility.

Case Study #1: The Atlantic States Marine Fisheries Commission

In the early to mid 1930s, several states in the Northeast began to witness a significant decline in stocks of striped bass, sturgeon, lobster and shad in the region. This prompted the State of New York to reach out to neighboring states to begin discussion around forming an interstate partnership focusing on the management of marine fisheries, and in 1937, New York lead by the Council of States Governments, convened the first Eastern States Conservation Conference (Atlantic States Marine Fisheries Commission, 2016a). The migratory behavior of many of the fish stocks of both high recreational and commercial value – including the striped bass and American shad – nudged these northern states to begin considering fisheries management as more a of a regional or interstate issue rather than solely the responsibility of each state. After several meetings between Fisheries management representatives from the states of Maine, New Hampshire, Rhode Island, Massachusetts, New York, New Jersey, Delaware, Maryland, and Virginia, it was decided that an interstate a "recommendatory" interstate compact would be the best structure for such an agreement with the following two provisions: 1) A fifteen-year life-span for the compact 2) the compact would report to each of the States as well as the U.S. Congress. After sign-off by each of the founding states mentioned above, and approval by the U.S. Congress, President Roosevelt signed-off on the creation of the Atlantic State Marine Fisheries Commission (ASMFC) on May 4, 1942.

Over the past 78 years, the ASMFC has operated as an interstate compact between all 15 states occupying geographic territory along the U.S. Atlantic Coast, as well as Pennsylvania – included through language in the *Compact & Rules and Regulations* documents as "any state contiguous with any of the aforementioned state and riparian upon waters frequented by anadromous fish, flowing into waters under the jurisdiction of any of the aforementioned states, may become a party hereto as hereinafter provided." (Atlantic States Marine Fisheries

Commission, 2016b). To-date, Pennsylvania is the only state without a border on the Atlantic Ocean with official membership and the District of Columbia is the only active non-member participant in the ASMFC. The mission of this interstate compact is "to promote the better utilization of the fisheries, marine, shell and anadromous, of the Atlantic seaboard by the development of a joint program for the promotion and protection of such fisheries, and by the prevention of physical waste of the fisheries from any cause" (Atlantic State Marine Fisheries Commission, 2020). The Commission aims to realize this mission by focusing on four main policy areas: the management of interstate fisheries stocks, fisheries science, law enforcement, and habitat conservation. Each member state is allocated three Commissioners – a member of the state legislator, the head of the state's marine fisheries management agency, and one member appointed by the Governor. Commissioners participate in the activities of the myriad boards, committees and panels covering every conceivable aspect of marine fisheries for the 26 species under the current purview of the ASMFC. Due to the interjurisdictional nature of the Commission, the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) work very closely with the Commission. A defining attribute of the ASMFC policy is the "one state, one vote" policy whereby the delegation of each state works through policies and issues until a single unified decision is reached and voted upon in front of the larger body.

Of its four main policy objectives, the management of interstate fisheries is the one that most closely resembles the management of common-pool resource required of this research paper. Similar to the multi-state nature of offshore wind development, marine and estuarine finfish species such as striped bass, red drum, and cobia – the management of which is overseen by the Commission – migrate between state boundaries depending on several factors such as (ie.

spawning, temperature, food sources, and seasonal variability). Overfishing and habitat loss among factors brought about the collapse of striped based fisheries across the U.S. range. In response, the U.S. Congress eventually granted the ASMFC authority to regulate fisheries through mandatory conservation measures imposed on the states. Through a series of amendments to the Atlantic Striped Bass Conservation Act (Striped Bass Act 1974) and later the Atlantic Coastal Fisheries Cooperative Management Act in 1993, states were required to submit fisheries management plans (FMP) to be approved by the ASMFC, which limited the recreational and commercial harvesting of the highly valuable species. Most states imposed outright moratoriums on the harvesting of striped bass, and as a result, coastal stocks reached full recovery status in 1995 (Atlantic State Marine Fisheries Commission, 2020).

As evidenced by battles between Northeastern commercial fishing interests and Vineyard Wind (as well as its predecessor Cape Wind) projects are required to gain the approval of different fisheries management bodies spanning numerous jurisdictions. Before finally agreeing to a $16.7 fisheries mitigation package, the Rhode Island Fisheries Advisory Board continuously rejected plans for the 800-MW Vineyard Wind project on the grounds that the wind farm would create “economic hardship for fisherman by forcing them to later their routes” (Young, Feb. 2019). These are the sort of patchwork, jurisdiction-by-jurisdiction battles that a congressional backed interstate similar to the ASMFC acting with one vote could help to alleviate should the opposition from commercial fisheries interests in the Southeast hit the point of “clarion call” mentioned by SIOW Executive Director Sopko (Nancy Sopko, personal communication, April 1, 2020). As alluded to earlier however by OSWE Sopko, Framme and Burdock, the formal regulatory structure of the ASMFC is likely would likely not be favored by in the statehouse or Executive offices in either of the three states.

Case Study #2: The Port Authority of New York and New Jersey

For hundreds of years, the greater New York City area busiest port suffered from "the wasteful and uncoordinated operation at the port was the result of almost 400 years of willy-nilly growth and technological advances and self-centered profiteering in seven bays, four rivers, four estuaries and numerous creeks" (Sheridan, 2017). While the U.S. economy weathered many ups and downs through the Revolutionary War, Civil, and the First World War, the New York saw itself isolated from the difficult times by way of a booming maritime commerce industry. But with the fortune of international trade also came a tangled mess of authorities and political opinions on how best to manage the world's foremost gateway for foreign trade. Lacking quayside regulation and chaotic terminal operations caused many shipments to be delayed, as passenger ships to arrive late to their destinations. New Jersey and New York first mutually committed to fixing the chaos by through an interstate pact in 1834, nothing became of the agreement and operations went on as business as usual for another 87 years (Sheridan, 2017).

It was until April 30, 1921 that the two behemoth states of maritime commerce would finally receive consent from Congress and formally agree to the nation's first public authority then called the Port of New York Authority. While not officially listed as such, the de facto mission provided on the Port Authority of New York and New Jersey (PANYNJ) website is "World-class transportation infrastructure is essential to economic growth and vitality. At the Port Authority of New York and New Jersey, we keep the region moving by air, land, rail and sea, so that the people and businesses of our region continue to thrive. With engineering in our DNA, we are shaping the future of the region with groundbreaking yet practical facilities and systems built for the 21st century" (Port Authority of New York and New Jersey, 2020). In order to fulfill this mission, the Port Authority has listed to 6 following standards and priorities:

1. Maintaining the highest levels of safety and security
2. Ensuring high-quality implementation (on time and on budget) of projects in the Port Authority's capital construction program (Capital Plan)
3. Improving customer experience
4. Ensuring operational excellence
5. Increasing the agency's focus on sustainability and environmental protection
6. Retaining, growing and attracting top talent as an employer of choice (Port Authority of New York and New Jersey, 2020).

Today, the Port Authority manages five airports including John F. Kennedy, Newark, and LaGuardia – the nation's sixth, eleventh, and twenty-first busiest airports in the nation respectively (Federal Aviation Administration, 2019), as well as all of the bridge crossings between the two states including the George Washington, Goethals, and Bayonne Bridges as well as the Holland and Lincoln Tunnels and Outerbridge Crossing. As per its original intent, the Port also manages the myriad shipping, container, and maritime shipping service facilities that account for 72% of all first ports of call on the U.S. East Coast, accounting for the largest port on the East Coast and the third largest in the nation (Port Authority of New York and New Jersey, 2020). Additionally, also the Authority maintains business terminals, train lines, and the World Trade Center.

Figure 10: Map of facilities and assets owned and operated by the Port Authority of New York and New Jersey (Port Authority of New York and New Jersey, 2020).

The Port Authority is managed by a 12-member Board of Commissioners, with each Governor picking six Commissioners. Board members serve six-year terms without pay, and their decisions can ultimately be vetoed by the Governor of their state. The Board appoints an Executive director to oversee the operations of the Port Authority "in a manner consistent with the agency's policies, as established by the Board" (The Port Authority of New York and new Jersey, 2020). As is the eventual goal of many quasi-governmental agencies, the PANYNJ is a financially self-sustaining entity that raises revenue through the tolls, fares, and other charged levied by its services. Per its bylaws, the Port Authority cannot levy assessments or taxes on either New Jersey or New York to help supplement its revenue, nor can it borrow using the credit of either state or neighboring municipalities. Instead, the NYNJPA uses its own credit rating to

borrow the funds and raise the private capital needed for future projects and to service existing debt, and maintains two reserve funds for this purpose: The General Reserve Fund and the Consolidated Bond Reserve Fund. The Authority's 2020 budget as approved in December of 2019 is $3.4 billion for operating expenses and $3.6 billion for capital spending. These figures account for an "inflation-based 1.9 percent increase of $64 million in core expenses" as compared to the $2019 budget, as well as $62 of incremental high priority spending (Port Authority of New York and New Jersey, 2019). In particular, the budget includes $787 million for increased security, $68 million to improve the "customer experience and to support increased volumes", and over $330 million to "support sustainability and resiliency efforts" (Port Authority of New York and New Jersey, 2019).

This financial aspect of the Port Authority lends itself to the idea raised by Framme of Ørsted that perhaps the utility players Duke and Dominion would be best-positioned to form a public authority around offshore wind. As is the case with the other similar entities such as the Long Island Power Authority, public authorities are able to both raise funds from private entities and access tax-exempt bond markets not available to other private entities (Dhanju, Firestone, Kempton, 2011). Given the delate between the existing low-cost of electricity in Carolina and Virginia compared with the far higher cost of offshore wind, a utility-formed power authority devoted to offshore wind could conceivably produce a far lower price for offshore wind projects using these municipal bond markets.

While the original intent of the centralized public-authority model of the 1920's was to remove politicization from the management of interstate public assets such as roads and railways, calls for reform of the have largely dominated public coverage of the NYNJPA nearly a century after it's inception. The most often leveled criticisms of the Authority are of the

governance structure, financial status, and inability to properly managed rail and road assets. Many on proponents of free-market solutions have advocated that while Authority "can and should be restructured" in way that shifts some of the economic burden away from the high fares and tolls paid by drivers and riders, the $20 billion-dollar total debt accrued by the Authority speaks to much deeper financial issues (Eide, 2016). The Idea have been made to spilt the Authority into two separate entities, for each state, or to restructure the way in which the Authority receives revenue. As described by a New York-based reporter in 2014 "the Port Authority's off-budget existence serves to insulate it from oversight", which he and many others argue has caused the very hyper-partisan governance the Authority was created to curb in the first place (Smith, 2014). By returning the tolls and fares currently being accrued by the Authority back to the respective general funds of each of the states, the ability to pursue controversial endeavors – such as the re-building of the World Trade Center and acquisition of vast amounts of expensive real estate – would be removed and the Authority would only be allowed to engage in maintaining existing asset such as bridges and roads.

The political control over the Board by the Governors is an aspect the came through as potentially damaging to prospects of this public authority model working in the Southeast. Burdock of the BNOW mentioned in great detail the long-standing differences in political ideology between the three Governors make a formal compact a near impossibility. (L. Burdock, personal communication, April 1, 2020). Sopko of the SIOW noted these differences are the well-known causes of the BOEM Long Bay Task Force having not yet met despite being announced in 2019 (N. Sopko, personal communication, April 1, 2020).

Case Study #3: The Governors' South Atlantic Alliance

An interstate cooperative body with a far less expansive history than the two previous models is the now defunct Governors' South Atlantic Alliance (GSAA). Established on October 19, 2009, the GSAA existed as a voluntary agreement between the Governors of the states of North Carolina, South Carolina, Georgia, and Florida with the following mission: "significantly increase regional collaboration among South Atlantic states, with federal agency partners and other stakeholders, to sustain and enhance the environmental (coastal/marine), natural resource, economic, public safety, social, and national defense missions of the respective states and the South Atlantic region" (Governors' South Atlantic Alliance, 2009). Along with the four participating States, the GSAA also includes the National Oceanic and Atmospheric Administration (NOAA), the Environmental Protection Agency (EPA), and U.S. Geological Survey under the Department of the Interior (DOI). The GSAA focused on both state-level and Federal ocean and coastal policy, and cooperated with both the private sector as well as non-profit organizations in the region.

As shown by Figure 11, the four Governors comprised the Executive Group, and provided both the vision and the ability to direct state resources to a particular issue identified by the larger group. The Steering Committee in partnership with Federal C-o-Chairs from the agencies described above – directed the programmatic and administrative policies and actions and made formal recommendations to the Executive Group. The Executive Planning Committee served as a review body for all activities, procedures and recommendations, and Issue and Technical Teams provided programmatic support for each of the Four Priority Issue Areas (Governors' South Atlantic Alliance, 2014, p.8).

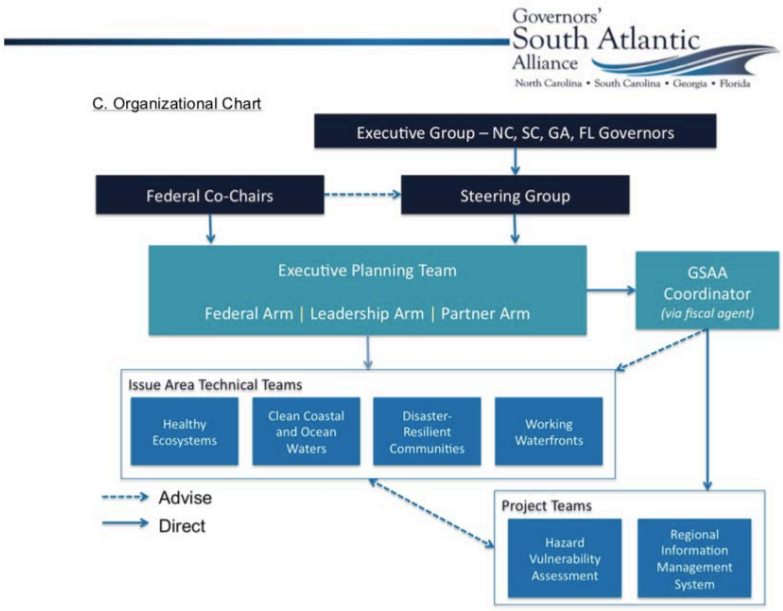

Figure 11: Organization Chart for the Governors' South Atlantic Alliance (Governors' South Atlantic Alliance, 2014, p.9).

In 2010, the Alliance published its Action Plan laying out goals and specific actions for achieving each of these Four Priority Issue Areas of "mutual importance to the Southeastern U.S. region's resources": Healthy Ecosystems, Working Waterfronts, Clean Coastal and Ocean Waters, and Disaster-Resilient Communities (Governors' South Atlantic Alliance, 2010, p. 4). As described in the Action Plan, The Working Waterfronts (WW) Policy Issue Area is:

"is to more effectively manage the future of our ports and other water access points by striking a balance among new development, historic uses, port expansion, and sustaining resources for the future by:

- sustaining and enhancing robust waterfront cultural traditions, commerce, and uses of public trust; and
- integrating coastal and land use planning tools to balance new development, historic uses, port expansion, and sustained resources for the future.

In order to achieve this goal, The Action Plan lays out three Objectives and Actions (W.W.1 through W.W.3), with WW3 – "Address the viability and effects of energy development on natural and human communities and uses through planning and public education" – directly involving the offshore wind industry (Governors' South Atlantic Alliance, 2010, p. 8). In fact, sub-goal WW3C states: "Ensure no-net loss of public access facilities during development of new off-shore energy industries" (Governors' South Atlantic Alliance, 2010, p. 8).

As a follow-up to the Action Plan, GSAA published an Implementation plan in 2011 which provided in-depth steps for implementation complete with timelines, prospective partners, and deliverables. The Action Plan lists the following Implementation Steps for WW3C:

1. Ensure that the military can sustain training and operational capabilities
   Timeline: 18 months
   Deliverable: Report and Policy Recommendations

2. Provide local governments guidance on establishing policy that prohibits the loss of public water access and requires mitigation when loss is unavoidable
   Timeline: 24 months
   Deliverable: Recommended Standards and Best Practices (Governors' South Atlantic Alliance, 2011, p. 25).

Additionally, despite the fact that the Action Plan made no explicit mention of energy development outside of Action WW3C, the Implementation Plan states that Action WW3B calls for policies addressing the "interface between energy development and other working waterfront issues" and encourages alignment with national ocean planning initiatives (Governors' South Atlantic Alliance, 2011, p. 24).

In April of 2016, the GSAA ceased operations as a formal structure after staff members spent a year in transition mode evaluating lessons learned, opportunities to meld with other regional collaborations, and the potential for restructuring. This style interstate recommendatory compact structure was mentioned by several OSWEs as a potentially great fit for the Southeast

Sopko, Burdock, and Framme all mentioned that model with a less formal structure than a full-fledged regulatory compact is best suited to address the challenges facing the Southeast. In particular, theses OSWEs highlighted the potential for such a model to coalesce the states around the supply chain need of the region, using their respective ports as a home base for operations. (N. Sopko, personal communication, April 1, 2020) (L. Burdock, personal communication, April 1, 2020), (H. Framme, personal communication, April 2, 2020).

Discussion

As discovered through interviews with OSWEs, key prevailing challenge areas to a sustainable offshore wind industry in the Southeast exist in a lacking business case for region, lacking and divergent regulatory and policy structures, conflicting use issues such as interference with sightline and a strong military presence, as well as environmental concerns. The existing low cost of electricity in Virginia, North Carolina, and South Carolina hovering at around 9 cents per kWh coupled with the best current price in the U.S. for offshore wind power at $58 per MWh, makes an investment in the latter a hard one to justify (International Energy Agency, 2019). The business case is made even more difficult when accounting for the distance between high-density load centers in each of the states and the resource itself as illustrated by Figure 4. Though out of the scope of this Capstone due to the technical nature of analysis involved, this dynamic which will surely add exorbitant capital costs for new transmission lines, substations and related infrastructure. The lack of an RPS with an offshore wind carve-out in either of the Carolinas put these states at a particular disadvantage, and lack of regulatory structure and experience throughout the three states has not only ushered in US Wind's exit from the Southeast, but it potentially portends uncertainty for developers in the future as echoed (S. Vitale, personal communication, March 29, 2020). The sightline issues and NIMBYISM

expressed by Sopko, Kollins, and Burdock are eerily similar to issues experienced by the failed Cape Wind project in the Northeast, as is the nascent Northern Right Whale problem mentioned by Nancy Sopko (N. Sopko, personal communication, April 1, 2020).

Due to the conflicting regulatory and policy pathways of the three states however, areas have also emerged where such an interstate collaboration would not be in the best interest of either the states involved, or the industry at-large. With separate state-level governments heading in different directions energy policy-wise, Virginia, North Carolina, and South Carolina are not well-positioned to engage in a formal partnership that dictates energy policy or regulatory function. With the Commonwealth of Virginia emerging as the early adopter of offshore wind in the Southeast, it is likely going to play a leadership role for years to come and will likely witness very few incentives for partnership with its southerly Carolina neighbors regarding offshore wind development.

Of the three regional cooperative models studied, the informal, yet effective structure of the Governor's South Atlantic Alliance lends itself best to the task at-hand. Despite it now being disbanded, it could serve as an excellent framework for addressing the key challenge areas of the Southeast for the reasons described above.

Conclusion

At the same time this Capstone was being finalized, the nacelles and towers for the CVOW project were making their way across the Atlantic Ocean from Port Esbjerg, Denmark for their staging location at the Port of Virginia, marking the arrival of a new industry to the Southeast with the potential to massively transform the economy of the region. In order to take full advantage of this upcoming wave of opportunity, Virginia, North Carolina, and South Carolina should begin the process of forming a regional collaborative building off the foundation

laid by the GSAA in order to tackle these key challenge areas. With a name like Southeast Offshore Wind Alliance (SOWA), energy and commerce leaders from each of the three states can do the necessary work now to convene the developers and stakeholders who will ultimately decide the fate of this industry, and fully embrace this once-in-a-lifetime opportunity to fundamentally change the energy economy of the Southeast.

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APPENDIX A

1. What is your involvement with the offshore wind industry in the U.S. Southeast? What are your states of primary focus?
2. In your opinion, what are the key challenges regarding supporting effective stewardship of offshore wind development in the southeast?
3. If not mentioned – How about regarding efficiency, consistency, and clarity in the regulatory process?
4. If not mentioned – How about regarding key environmental and human-use concerns?
5. In your opinion, what are the key challenges to increasing the understanding of the benefits and costs of offshore wind in Virginia, North Carolina, and South Carolina?
6. If not mentioned – How about regarding electricity delivery and grid connections?
7. If not mentioned – How about regarding quantifying and communicating the benefits and costs?
8. From your experience, what other key challenge areas exists in the southeast (VA, NC, SC)?
9. Do you think that a regional collaborative approach between the states of Virginia, North Carolina, and South Carolina, could be an effective way to address these challenges?
10. If so, do you have any recommendations of existing interstate compact models that you feel are best suited for this purpose?
11. Do you feel that either of the above interstate cooperative models is particularly well suited to address the key we've mentioned in this interview?
12. What else would you like to discuss regarding using challenges to the offshore wind industry in the southeast and potential interstate cooperative models that we haven't yet discussed?